Arizona July 1, 2014 Population Estimates – Methodology

COUNTY ESTIMATES

The county-level estimates (county controls) are developed using a Composite Method which relies on several sources of administrative data for four age groups: births and deaths for ages 0-4, school enrollment for ages 5-17, driver's licenses and ID cards for ages 18-64, and Medicare and Social Security enrollments for ages 65+. In general, we create a ratio of the census household population in each age group to the population indicated by administrative records for the census date. This ratio, called Censal Ratio, is applied to the administrative data for the reference date of July 1 of the estimate year. The independent population estimates for each age group are added together to obtain the Household population for each county. The Group Quarters (GQ) population is then added to produce the Total population control for each county.

GQ population is estimated in the following steps:

1. Establish the total GQ population in each place (incorporated place or unincorporated balance of county) as of Census 2010 (taking Count Question Resolution into consideration);
2. Track the GQ population of major facilities annually starting April 2010 and for each subsequent July;
3. Find the change in GQ population in these facilities between April 2010 and the estimate year. If data is missing for either April 2010 or for the estimate year, then that record is not used in calculating the change;
4. Estimate total GQ population of each place by adding numbers from Step 1 and Step 3.

SUB-COUNTY ESTIMATES

Estimates for incorporated places and unincorporated balances of county are produced using the controlled housing unit method (HUM). The following steps are executed:

1. Use the latest Count Question Resolution results to update Census 2010 housing units, occupancy rates, persons per household, household population and Group Quarters population for each jurisdiction.
2. Determine the July 1, 2014 housing unit stock by adding new completions or building permits to the July 1, 2013 housing stock. For permits, a six-month lag is assumed for single-family units and 2-4 units; a 12-month lag is assumed for 5-plus-unit buildings. It is assumed that 98% of permits are built. Mobile homes are assumed to be in place the same quarter they are permitted with a 100% placement rate.

3. Pre-annexation household population is calculated by multiplying the new housing unit stock by census occupancy rate and persons per household.
4. For annexations that contain housing units, the actual number of occupants is determined from field information. If that is not possible, census block-level occupancy rate and persons per household are used. When block-level data is unavailable, the annexing jurisdiction's census occupancy rate and persons per household information is used. The corresponding number of persons is then subtracted from the jurisdiction that deannexed the housing units.
5. Adding up the numbers from steps 3 and 4 results in the uncontrolled household population for each jurisdiction; this is summed up at the county level.
6. The county's HUM household population is then divided into the household population control obtained from the composite method to yield a "control factor" for each county.
7. The control factor is multiplied by the uncontrolled household population estimate of each jurisdiction to get the "controlled" household population estimate.
8. Sub-county estimates are then finalized by adding the GQ population in at the jurisdiction level.

ADJUSTMENTS AND SPECIAL METHODS

0-4 Age Group Censal Ratio Adjustment

The original censal ratio was calculated using the births and deaths between 4/1/2005 and 3/31/2010 and the enumerated population on 4/1/2010. The resulting censal ratio reflected net migration that occurred during the period of 4/1/2005 to 3/31/2010. Because this five year period was likely dominated by outmigration in the later part, the censal ratio for the state amounted to 0.934, or a 6.6% outmigration rate. Most counties experienced outmigration (except for Graham, Greenlee, and Pinal). This magnitude of outmigration, and perhaps the direction of net migration, is likely not accurate for the present year (or the past three to four years).

In the adjusted method, different censal ratios are applied to two groups of children who were born and survived within the last five years. For the group born between 7/1/2009 and 6/30/2010, we assume that the experience of outmigration is true and apply the original censal ratios to the input data. For the group born between 7/1/2010 and 6/30/2014, we assume that 0 net migration took place and use a censal ratio of 1. We make this assumption because any positive migration that may have occurred was likely low. This logic is applied to all counties except for Graham and Greenlee, where we believe that the positive net migration is reasonable due to continued economic growth. Pinal had a censal ratio much greater than 1. However, there is no evidence that large-scale in-migration continued in the past four years. Therefore, the same assumption is made for Pinal as for the other 12 counties.

Greenlee County Special Methods

Due to the reopening and expansion of the Freeport-McMoRan Gold and Copper (FMI) mine, there is overwhelming evidence that Greenlee County has experienced rapid population growth in the past three years. However, the composite method does not adequately capture this rapid growth. We decide not to use the composite method for Greenlee, but instead rely on other methods – the housing resident information from FMI in the case of Clifton and Morenci (Balance of Greenlee County), and HUM plus electric accounts in the case of Duncan.

The basic principle of the method using FMI information is to find the change in the number of residents since Census 2010 and add that change to the Census 2010 population. FMI keeps a good record of their housing inventory and residents. The earliest list that was provided to ADOA is for 8/30/2010. The current one is as of 10/30/2014. FMI confirmed that all the housing units on the 10/30/2014 list were already in place as of 7/1/2014. We also know that FMI was adding to its workforce between April and August of 2010. This will be addressed in Step 5c.

1. Find Census 2010 housing and population information for Clifton and Balance of Greenlee County.
2. Enter FMI housing and residents information as of 8/30/2010.
3. Enter FMI housing and residents information as of 10/30/2014.
4. Find changes of housing units and number of residents at FMI between 8/30/2010 and 10/30/2014 (Step 3 minus Step 2).
5. Find additional changes in population between 2010 and 2014 as determined from other sources:
    a. Known permanent residents in RV parks in Clifton.
    b. People on the FMI housing waiting list. These are FMI employees presumably already living in the area. They may have additional family members, but since we do not know the number, we are not counting family. They are assigned to Clifton and balance of county according to the location proportion found among FMI housing residents (56% in Clifton and 44% in balance of county).
    c. Estimated change in the number of residents between April and August of 2010. This is the product of two factors: 1) the change in the number of FMI employees; 2) the ratio of FMI residents to employees. Both factors are based on confidential QCEW data, and therefore the exact source data and calculations are kept confidential.
6. Adding Steps 4 and 5 to the Census 2010 household population in Step 1 results in the household population as of July 1, 2014.

With this method, we try to account for the changes for which we have accurate information. We are aware that there are other changes. However, because we do not have a reliable measure of their magnitude, we decide to leave them out at this point.

We are also aware that there are a large number of contractors working in the area, some of whom (up to 425) currently stay at the Desert Sage Lodge managed by Target Logistics.

Managers at Target Logistics and FMI stated that most of these people use the lodge as a temporary dwelling. Most of them have a regular residence to return to when they are not working. Since they are not "regular residents," and neither FMI nor Target Logistics can tell us the exact number of residents, we decide not to include them. We are taking the same approach with contractors who might be staying elsewhere in the county.

For Duncan, the following steps are followed:

1. Using data from Duncan Valley Electric Cooperative, determine the number of active residential electric accounts with at least 100 kWh average monthly use plus "Inactive" accounts with a 10 month history and at least 100 kWh average monthly use.
2. From the street drive conducted by personnel from City of Duncan, Greenlee County, SEAGO, and ADOA in December 2013, estimate the number of RVs, mobile homes, and trailers that do not have their own electric meters (hooked up to housing units or as part of a master-metered RV/trailer park).
3. Add the numbers from Steps 1 and 2 together to estimate the total number of occupied units.
4. Obtain the 2010 Census persons per household for Duncan.
5. Apply the persons per household from Step 4 to the number in Step 3 to obtain the 2014 population estimate of the Town of Duncan.

ADOA adopted the population estimates produced by Maricopa Association of Governments (MAG) for places within Maricopa County. MAG applied a slight variation of the HUM method to distribute the ADOA County Control to its member jurisdictions. The methodology can be referenced at:
https://population.az.gov/sites/default/files/documents/files/pop-estimates2014-mag-method.pdf.